

DAYLIGHTING DESIGN:

The advantage of having a north facing facade improves the opportunities with daylighting without unwanted solar gain. With this daylighting design, the focus is on the retail aspect of the project. A typical retail floor plate is used to determine the data. This particular space in the project has quite a bit of glazing on the north facade, but a shallow depth allowing daylight to penetrate into the space.

ORDER OF MAGNITUDE VALUES FOR AMBIENT LIGHTING

RULE: $FC = LPW \times LPD \times CU \times LLF$

VARIABLE NAME	MEASURE	INPUT	YOUR RANGE			NORMALS	
	units	value	min	max	min	max	
LPW, LAMP EFFICIENCY, EFFICACY	lumens/Watt	93.0	15.0	90.0	12.0	140.0	
LPD, LIGHTING POWER DENSITY	Watts/sq ft	1.0	0.5	2.5	0.5	3.5	
CU, ESTIMATE FIXTURE EFFICIENCY	percent	62%	30%	65%	40%	80%	
LLF, ESTIMATE LIGHT LOSS FACTORS	percent	88%	40%	88%	40%	80%	
RESULTING ILLUMINATION LEVEL	footcandles	51	1	129	0	500	

140
120
100
80
60
40
20
0

FOOTCANDLES

maximum
value
minimum

fine work
+
drawing
+
office
+
assembly
+
corridor
+

Vertical (Value) Axis Major Gridlines

MANTAINED LLUMINATION (FOOTCANDLE) LEVELS
PRODUCE UNIFORM BACKGROUND LIGHTING FOR
ORIENTATION IN ROOMS AND SOMETIMES PROVIDE TASK
LEVEL LLUMINATION. AT THE PRELIMINARY DESIGN
LEVEL, FOOTCANDLES CAN BE ESTIMATED AS THE
PRODUCT OF FOUR VARIABLES: LAMP EFFICACY,
LIGHTING POWER DENSITY BUDGETS, FIXTURE
EFFICIENCY AND LIGHT LOSS FACTORS. THESE FACTORS
CAN BE MANIPULATED BY THE DESIGNER TO DETERMINE
THE AMOUNT OF ENERGY REQUIRED TO PROVIDE A
DESIRED LEVEL OF LLUMINATION. EXPERIMENTING WITH
EACH OF THE VARIABLES REVEALS THE INTERPLAY OF
CHOICES. NOTE THAT EACH OF THE FOUR FACTORS HAS
EQUAL EFFECT ON ILLUMINATION AND ENERGY USE.

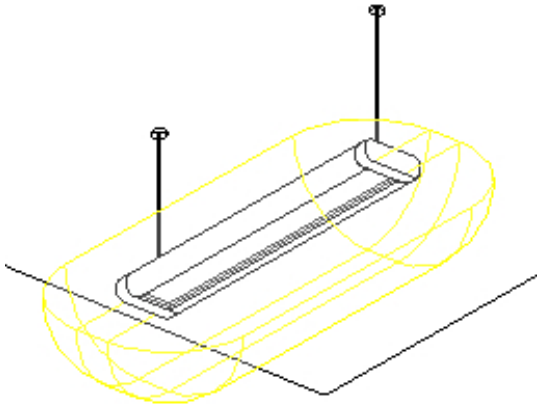
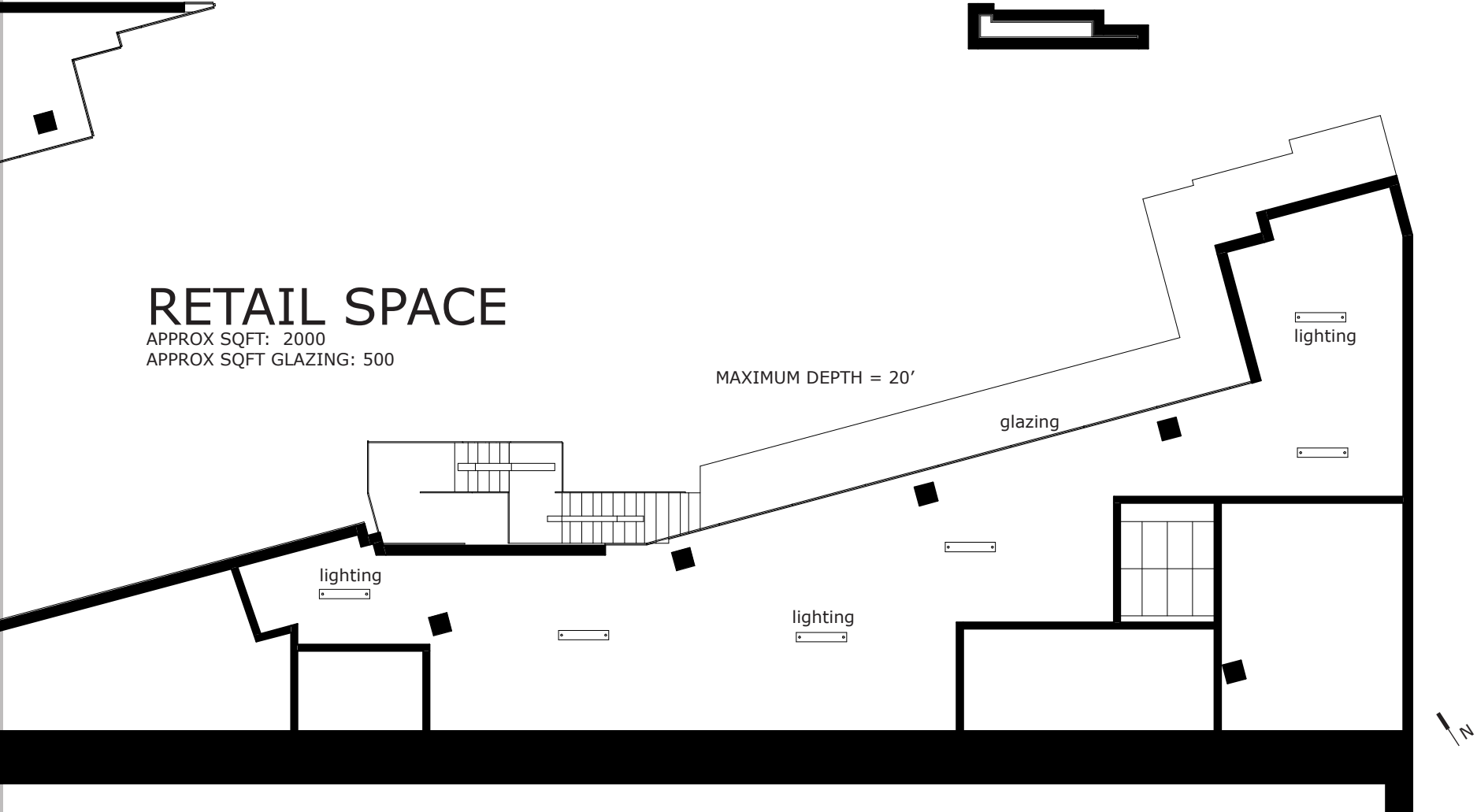
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Scheme Data: Dimensional Parameters											
Length, ft						Width, ft					
Aspect		1	2	3	4	5	1	2	3	4	5
S	1	29.15	41.23	50.50	58.31	65.19	29.15	20.62	16.83	14.58	13.04
T	2	20.62	29.15	35.71	41.23	46.10	20.62	14.58	11.90	10.31	9.22
O	3	16.83	23.80	29.15	33.67	37.64	16.83	11.90	9.72	8.42	7.53
R	4	14.58	20.62	25.25	29.15	32.60	14.58	10.31	8.42	7.29	6.52
Y	5	13.04	18.44	22.58	26.08	29.15	13.04	9.22	7.53	6.52	5.83
Wall Surface Area						Surface to Volume Ratio, sqft/cuft					
Aspect		1	2	3	4	5	1	2	3	4	5
S	1	1865.9	1979.09	2154.56	2332.38	2503.37	0.1372	0.14552	0.15842	0.1715	0.18407
T	2	2638.79	2798.86	3047.01	3298.48	3540.31	0.19403	0.2058	0.22404	0.24254	0.26032
O	3	3231.84	3427.89	3731.81	4039.8	4335.97	0.23764	0.25205	0.2744	0.29704	0.31882
R	4	3731.81	3958.18	4309.12	4664.76	5006.75	0.2744	0.29104	0.31685	0.343	0.36814
Y	5	4172.29	4425.38	4817.74	5215.36	5597.71	0.30679	0.3254	0.35425	0.38348	0.4116
Perimeter Floor Area						Interior Floor Area					
Aspect		1	2	3	4	5	1	2	3	4	5
S	1	849.286	850	850	850	850	-1667.6	-1526.1	-1306.8	-1084.5	-870.78
T	2	673.863	823.928	850	850	850	-4701.5	-4501.4	-4191.2	-3876.9	-3574.6
O	3	329.851	513.643	798.571	850	850	-7960.2	-7715.1	-7335.2	-6950.2	-6580
R	4	-101.43	110.795	439.802	773.214	850	-11335	-11052	-10614	-10169	-9741.6
Y	5	-588.48	-351.2	16.6359	389.402	747.857	-14785	-14468	-13978	-13481	-13003

Project Name:
3500 STUDIO PROJECT

City, Country
Houston, Texas USA

Latitude/Longitude/Elevation
29°45'46"N 95°22'59"W
43ft



DAVID NORTHCUTT BROWN
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ARCH 3427
TECHNOLOGY 3

DOSSIER ONE